

Appendix D
Insignificant Activities

Appendix D.1
Fuel Transfer Dispensing

Number of Fuel Dispensing Operations Identified: 14

Emission Source Type: Stationary

Emission Source ID: FD

D.1 Background

D.1.1 General

Mountain Home AFB uses JP-8, gasoline (mogas), diesel, and fuel oil. The base's fueling operations consist of bulk storage of fuel delivered to the base, distribution of fuel from bulk storage to dispensing sites, and dispensing of fuel to combustion uses.

- **JP-8.** JP-8 is delivered to the base by pipeline. It is directly transferred to three 1,500,000-gallon ASTs for initial storage. From these tanks it is piped to the petroleum, oils, and lubricants (POL) loading racks for distribution throughout the base. Tanker trucks then distribute JP-8 to the aboveground storage tank (AST) at Hush House No. 1, the AST at the Aerospace Ground Equipment (AGE) refueling station, and aircraft. In addition to this operation, JP-8 is transferred from the initial storage tanks (by pipeline) to three USTs associated with hydrant aircraft refueling operations.

- **Gasoline.** Gasoline is delivered to the base by tanker trucks. It is unloaded into two 10,000-gallon aboveground storage tanks (ASTs) for initial storage. From the two ASTs, it is piped to the POL fuel loading racks and loaded into tanker trucks for distribution throughout the base. Tanker trucks then distribute gasoline to the AST at the AGE refueling station, the AST located at the grounds building, the ASTs associated with golf course operations, and the ASTs at the base vehicle refueling station.

In addition to base operations, gasoline is dispensed to privately owned vehicles at the AAFES gas station. Gasoline purchased for this latter operation is independent of base activities and not tracked by the POL group. Stage I and II vapor controls are used. Vapors collected through Stage II are transported to Boise and burned at the Northwest Chevron Terminal.

- **Diesel Fuel.** Diesel fuel is delivered to the base by tanker trucks. It is unloaded into two 30,000-gallon ASTs for initial storage. From the storage tanks it is piped to the POL fuel loading racks and loaded into tanker trucks for distribution throughout the base. The tanker trucks then distribute diesel to ASTs and underground storage tanks (USTs) associated with emergency generators/firepumps, the 266th Range Squadron, the AST located at the base vehicle refueling station, the AST located at the AGE refueling station, and the AST located at the landfill.

D. Fuel Transfer/Dispensing

Annual fuel consumption for Mountain Home AFB is shown in Appendix AAA-1.

Fuel dispensing includes the transfer of fuels from ASTs, USTs, and tanker trucks into various engine fuel tanks (i.e., aircraft, motor vehicles, and other equipment). It is dispensed at the following locations: AAFES Gas Station, Base Vehicle Refueling Station, AGE refueling station, Grounds, Golf Course Clubhouse, Flightline, Hush House No. 1, and the Landfill (Table D-1).

D.2 Emission Calculation Method

The APIMS standard algorithm codes FDSP-02 and FDSP-03 were identified to calculate VOC and HAP emissions from dispensing operations. The APIMS standard algorithm code FLD-01 was identified to calculate VOC and HAP emissions associated with basewide fueling and defueling of JP-8. HAP emissions were speciated based on JP-8, gasoline, and diesel fuel constituents in Table D-2.

D.3 Sample Calculations

D.3.1 Dispensing Operations

The following data were used for these calculations:

- Facility name: AAFESGASSTA (ID FD 6200): Quantity dispensed = 1,893,939 gals/yr. Stage I and II vapor controls were used.
- Toluene weight percent (in vapor phase) = 0.7%.

D.3.1.1 VOC Calculations

$$VOC_{Total} = (GT)(EF)$$

where:

VOC = VOC emissions from a gasoline service station (lbs/yr);

GT = Gasoline throughput in gallons per year (gals/yr);

EF = APIMS VOC emission factor for gasoline associate with vapor dispensing

$$VOC_{Total} = \left(1,893,939 \frac{\text{gals}}{\text{yr}} \right) \left(0.0018 \frac{\text{lbs}}{\text{gal}} \right) = 3,409 \text{ lbs/yr}$$

D.3.1.2 Toluene Calculations

Toluene emissions associated with evaporative losses from ASTs and automobile tanks were calculated by multiplying the VOC emission results associated with evaporation by the weight fraction of toluene in the vapor phase (0.7%).

$$\text{Toluene} = \left(3,409 \frac{\text{lb}}{\text{yr}} \right) (0.007) = 23.9 \text{ lbs/yr}$$

D.3.2 Aircraft Fueling and Defueling Operations

Basewide fueling and defueling of JP-8 involved the following facilities: FDAIRCRAFT.1, FDAIRCRAFT.2, and FDAIRCRAFT.3.

- Facility ID: FDAIRCRAFT.1;
- Quantity of JP-8 used to refuel aircraft using trucks = 20,483,269 gal/yr;
- JP-8 is transferred from ASTs to tank trucks using the submerged fill-pipe method;
- Toluene weight percent in vapor phase = 1.65%; and
- Annual average ambient temperature = 52°F (512°R).
(Note: °R = °F + 460.)

D.3.2.1 VOC Calculations

VOC emissions from fueling and defueling transfer operations were calculated by multiplying the amount of fuel loaded by the loading loss:

$$\text{VOC} = F * S * 0.01246 * VP * MW/T$$

where:

F = Quantity of Fuel transferred;

S = Saturation Factor (0.6 lb/lb) for submerged fill with no vapor recovery

$$0.01246 = \text{Constant} \left(\frac{\text{lb - mole - } ^\circ\text{R}}{\text{gal - psia}} \right)$$

T = Temperature of bulk liquid loaded (512°R);

D. Fuel Transfer/Dispensing

VP = Vapor Pressure of JP-8 (0.02 psia);

M = Molecular wt of vapors (130 lb/lb-mole for JP-8);

The following equation is an example emission calculation for the transfer of JP-8 to aircraft:

$$E_{VOC} = \left(20,483,269 \frac{\text{gals}}{\text{yr}} \right) (0.6) \left[(0.01246)(0.02 \text{ psia}) \left(130 \frac{\text{lbs}}{\text{lb-mole}} \right) / 512^{\circ}\text{R} \right] = 778 \frac{\text{lbs}}{\text{yr}}$$

D.3.2.2 Toluene Calculations

Toluene emissions were calculated by multiplying total VOC emissions from JP-8 operation (645 lbs/year) by the weight fraction of toluene in the vapor phase.

$$E_{Toluene} = \left(778 \frac{\text{lbs}}{\text{yr}} \right) \left(\frac{1.65}{100} \right) = 12.8 \frac{\text{lbs}}{\text{yr}}$$

D.4 Actual Emissions Summary

The APIMS Process ID and actual annual VOC emissions are presented in Table D-3. The APIMS Process ID and actual annual HAP emissions are presented in Table D-4.

D.5 Potential Emissions Summary

Potential emissions from the AAFES gasoline station were based on the assumption that hours of operation increase from an actual 20 hrs/day to a potential 24 hrs/day ($K_{p/a} = 1.2$).

Potential emissions from JP-8 dispensing to jet engine testing were based on the actual number of tests for the idle power setting and the potential number of jet engine tests ($K_{p/a} = 2.82$).

Potential emissions from dispensing JP-8 to aircraft and AGE were based on potential increases in aircraft operations ($K_{p/a} = 1.5$).

Potential emissions from dispensing fuels to base vehicles/equipment, grounds maintenance equipment, golf course equipment, and landfill heavy equipment were calculated using a $K_{p/a} = 4.21$.

Potential usage of diesel-fueled external and internal combustion engines was based on potential operations of this equipment.

$K_{p/a}$ values, APIMS Process ID and potential annual VOC emissions are presented in Table D-5. The APIMS Process ID and potential annual HAP emissions are presented in Table D-6.

Table D-1
CY 2005 ACTUAL ANNUAL FUEL SUMMARY FROM FUEL DISPENSING OPERATIONS

ID	Location	FACILITY ID	Comments	Fuel	Quantity Dispensed (gal/yr)
FD6200	BLDG 6200	AAFESEGASSTA	Dispensing of gasoline from ASTs to privately owned vehicles	Gasoline	1,893,939
FD1310.1	BLDG 1310	VEHFUELSTA	Dispensing of mogas from ASTs to base vehicles/equipment	Gasoline	94,286
FD1310.2			Dispensing of diesel from ASTs to base vehicles/equipment	Diesel	97,317
FD1369.3	BLDG 1369	AGE	Dispensing of mogas and JP-8 from ASTs to AGE	Gasoline	0
FD1369.1-2 -.4			Dispensing of Diesel ASTs to AGE	Diesel	941
FD1356	GROUND		Dispensing of Diesel ASTs to JP-8	JP-8	185,014
			Dispensing of gasoline by truck to ASTs for ground equipment	Gasoline	4,154
			Dispensing of diesel by truck to ASTs for ground equipment	Diesel	26,590
FD4109.1	BLDG 4109	CLUBHSE	Dispensing of gasoline and diesel from an AST to golf course equipment	Gasoline	2,484
FD4109.2			Dispensing of gasoline and diesel from an AST to golf course equipment	Diesel	1,300
FD1344	BLDG 1344	HUSHHSE1	Dispensing of JP-8 from an AST to jet engine testing	JP-8	115,313
FDAIRCRAFT.1	BASEWIDE		Fueling JP-8 to aircraft using trucks	JP-8	20,483,269
FDAIRCRAFT.2	BASEWIDE		Fueling JP-8 to aircraft using hydrants	JP-8	2,449,184
FDAIRCRAFT.3	BASEWIDE		Defueling JP-8 from aircraft	JP-8	1,311,016
FDLANDFILL	LANDFILL		Dispensing of diesel from an AST to heavy equipment	Diesel	6,612
Subtotal JP-8					24,543,796
Subtotal diesel					132,760
Subtotal gasoline					1,994,863
Total					26,671,419

Table D-2 HAP SPECIATION FROM FUEL DISPENSING OPERATIONS					
HAP	CAS No.		JP-8	Vapor Phase Wt Percent (%) ¹	
		Mogas		Diesel	
Ethylbenzene	100-41-4	0.86		0.04	0.7
P-Xylene	106-42-3	0.71		0	0
M-Xylene	108-38-3	2.42		0	0
Toluene	108-88-3	1.65		0.7	4.1
Hexane	110-54-3	0.84		0.5	0
2,2,4-Trimethylpentane	540-84-1	0.02		0.7	2.3
Benzene	71-43-2	0.2		0.6	7.2
Naphthalene	91-20-3	0.38		0	0
O-Xylenes	95-47-6	1.61		0	0
Cumene	98-82-8	0.29		0.02	0.4
Xylene (mixed)	1330-20-7	0		0.2	2.5
MTBE	1634-04-4	0		4.6	0

Note:

1. Volatile Speciation for Mogas and Diesel based on Air Emissions Inventory Guidance Document for Stationary Institute for Environment, Safety, and Occupational Risk Analysis, 1999).
- Sources at Air Force Installations USAF Volatile Speciation for JP-8 based on Air Emissions Inventory Guidance Document for Stationary Sources at Air Force Installations (USAF Institute for Environment, Safety, and Occupational Risk Analysis, 2001).

2005 Actual Emissions

Table D-3

Calculation Name: FUEL DISPENSING

Process ID	Process Name	Unique Process ID	CAS No.	Chem. Name	Emissions (LBS)	Emissions (Ton)
FU1354938...	DISPENSING - FD6200 - GAS	938	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	3409.0902	1.704545
FU1354939...	DISPENSING - FD1310.1 - MOGAS	939	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	169.7148	0.084857
FU1354940...	DISPENSING - FD1310.2 - DIESEL	940	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	89.4343	0.044717
FU1354942...	DISPENSING - FD1369.3 - DIESEL	942	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	0.8648	0.000452
FU1354943...	DISPENSING - FD1369.1-2.4 - JP-8	943	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	168.9178	0.084459
FU1354946...GRD-DIE	GROUNDS-DIESEL	1346	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	24.4362	0.012218
FU1354944...	DISPENSING - GROUNDS- GASOLINE	944	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	7.4772	0.003739
FU1354945...	DISPENSING - FD4109.1 - GASOLINE	945	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	4.4712	0.002236
FU1354946...	DISPENSING - FD4109.2 - DIESEL	946	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	1.1947	0.000597
FU1354947...	DISPENSING - FD1344 - JP-8	947	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	105.2008	0.05264
FU1354951...	DISPENSING - FDLANDFILL - DIESEL	951	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	6.0764	0.003038
FU1354948...	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	778.1296	0.389065
FU1354949...	DISPENSING - FDAIRCRAFT 2 - JP-8 - HYDRANTS	949	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	93.0409	0.04652
FU1354950...	DISPENSING - FDAIRCRAFT 3 - JP-8 - DEFUELING	950	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	49.8036	0.024902
				Sum CAS: VOC	4907.9325	2.453965

2005 HAP Actual Emissions

Table D-4

Calculation Name: FUEL DISPENSING

Process ID	Process Name	Unique Process ID	CAS No.	Chem. Name	Emissions (LBS)	Emissions (Ton)
FU1334938---	DISPENSING - FD6200 - GAS	938	100414	ETHYLBENZENE	1.3636	0.000682
FU1334939---	DISPENSING - FD1310.1 - MOGAS	939	100414	ETHYLBENZENE	0.0679	0.000034
FU1334940---	DISPENSING - FD1310.2 - DIESEL	940	100414	ETHYLBENZENE	0.626	0.000313
FU1334942---	DISPENSING - FD1369.3 - DIESEL	942	100414	ETHYLBENZENE	0.061	0.000003
FU1334943---	DISPENSING - FD1369.1-2-4 - JP-8	943	100414	ETHYLBENZENE	1.4527	0.000726
FU133541346 - GRD-DIE	GROUNDS-DIESEL	1346	100414	ETHYLBENZENE	0.1711	0.000086
FU1334944---	DISPENSING - GROUNDS- GASOLINE	944	100414	ETHYLBENZENE	0.003	0.000002
FU1334945---	DISPENSING - FD4109.1 - GASOLINE	945	100414	ETHYLBENZENE	0.0118	0.000001
FU1334946---	DISPENSING - FD4109.2 - DIESEL	946	100414	ETHYLBENZENE	0.0084	0.000004
FU1334947---	DISPENSING - FD1344 - JP-8	947	100414	ETHYLBENZENE	0.9054	0.00453
FU1334951---	DISPENSING - FDLANDFILL - DIESEL	951	100414	ETHYLBENZENE	0.0425	0.000021
FU1334948---	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948	100414	ETHYLBENZENE	6.6919	0.003346
FU1334949---	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949	100414	ETHYLBENZENE	0.8002	0.0004
FU1334950---	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950	100414	ETHYLBENZENE	0.4283	0.000214
	Sum CAS: 100414				12.5689	0.0006285
FU1334943---	DISPENSING - FD1369.1-2-4 - JP-8	943	106423	P-XYLENE	1.1993	0.0006
FU1334947---	DISPENSING - FD1344 - JP-8	947	106423	P-XYLENE	0.7475	0.000374
FU1334948---	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948	106423	P-XYLENE	5.5247	0.002762
FU1334949---	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949	106423	P-XYLENE	0.6606	0.00033
FU1334950---	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950	106423	P-XYLENE	0.3536	0.000177
	Sum CAS: 106423				8.4857	0.004243
FU1354943---	DISPENSING - FD1369.1-2-4 - JP-8	943	108383	M-XYLENE	4.0878	0.002044
FU1354947---	DISPENSING - FD1344 - JP-8	947	108383	M-XYLENE	2.5478	0.001274
FU1354948---	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948	108383	M-XYLENE	18.8307	0.009415
FU1354949---	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949	108383	M-XYLENE	2.2516	0.001126
FU1354950---	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950	108383	M-XYLENE	1.2052	0.000603
	Sum CAS: 108383				28.9231	0.014462

FU1354938---	DISPENSING - FD6200 - GAS	938 108883	TOLUENE	23.8636	0.011932
FU1354939---	DISPENSING - FD1310.1 - MOGAS	939 108883	TOLUENE	1.188	0.000594
FU1354940---	DISPENSING - FD1310.2 - DIESEL	940 108883	TOLUENE	3.6668	0.001833
FU1354942--	DISPENSING - FD1369.3 - DIESEL	942 108883	TOLUENE	0.0355	0.000018
FU1354943--	DISPENSING - FD1369.1-2-4 - JP-8	943 108883	TOLUENE	2.7871	0.001394
FU1354946--GRD-DIE	GROUNDS-DIESEL	1346 108883	TOLUENE	1.0019	0.000501
FU1354947--	DISPENSING - GROUNDS- GASOLINE	944 108883	TOLUENE	0.0523	0.000026
FU1354945--	DISPENSING - FD4109.1 - GASOLINE	945 108883	TOLUENE	0.0313	0.000016
FU1354946--	DISPENSING - FD4109.2 - DIESEL	946 108883	TOLUENE	0.049	0.000025
FU1354947--	DISPENSING - FD1344 -JP-8	947 108883	TOLUENE	1.7371	0.000869
FU1354951--	DISPENSING - FDLANDFILL - DIESEL	951 108883	TOLUENE	0.2491	0.000125
FU1354948--	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948 108883	TOLUENE	12.8391	0.00642
FU1354949--	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949 108883	TOLUENE	1.5352	0.000738
FU1354950--	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950 108883	TOLUENE	0.8218	0.000411
Sum CAS: 108883				49.8578	0.024932
FU1354938--	DISPENSING - FD6200 - GAS	938 110543	HEXANE	17.0455	0.008553
FU1354939--	DISPENSING - FD1310.1 - MOGAS	939 110543	HEXANE	0.8486	0.000424
FU1354943--	DISPENSING - FD1369.1-2-4 - JP-8	943 110543	HEXANE	1.4189	0.000709
FU1354944--	DISPENSING - GROUNDS- GASOLINE	944 110543	HEXANE	0.0374	0.000019
FU1354945--	DISPENSING - FD4109.1 - GASOLINE	945 110543	HEXANE	0.0224	0.000011
FU1354947--	DISPENSING - FD1344 -JP-8	947 110543	HEXANE	0.8544	0.000442
FU1354948--	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948 110543	HEXANE	6.5563	0.003268
FU1354949--	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949 110543	HEXANE	0.7815	0.000391
FU1354950--	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950 110543	HEXANE	0.4184	0.000209
Sum CAS: 110543				27.9334	0.013936
FU1354938--	DISPENSING - FD6200 - GAS	938 1330207	XYLENE (MIXED)	6.8182	0.003409
FU1354939--	DISPENSING - FD1310.1 - MOGAS	939 1330207	XYLENE (MIXED)	0.3394	0.00017
FU1354940--	DISPENSING - FD1310.2 - DIESEL	940 1330207	XYLENE (MIXED)	2.2559	0.001118
FU1354942--	DISPENSING - FD1369.3 - DIESEL	942 1330207	XYLENE (MIXED)	0.0216	0.000011
FU1354943--	DISPENSING - FD1369.1-2-4 - JP-8	943 1330207	XYLENE (MIXED)	8.0687	0.004003
FU1354946--GRD-DIE	GROUNDS-DIESEL	1346 1330207	XYLENE (MIXED)	0.6109	0.000305
FU1354944--	DISPENSING - GROUNDS- GASOLINE	944 1330207	XYLENE (MIXED)	0.0115	0.000008
FU1354945--	DISPENSING - FD4109.1 - GASOLINE	945 1330207	XYLENE (MIXED)	0.0089	0.000004
FU1354946--	DISPENSING - FD4109.2 - DIESEL	946 1330207	XYLENE (MIXED)	0.0299	0.000015
FU1354947--	DISPENSING - FD1344 -JP-8	947 1330207	XYLENE (MIXED)	4.9903	0.002495
FU1354951--	DISPENSING - FDLANDFILL - DIESEL	951 1330207	XYLENE (MIXED)	0.1519	0.000076
Sum CAS: 1330207				23.2287	0.011614
FU1354938--	DISPENSING - FD6200 - GAS	938 1634044	METHYL TERT-BUTYL ETHER	156.8181	0.078409
FU1354939--	DISPENSING - FD1310.1 - MOGAS	939 1634044	METHYL TERT-BUTYL ETHER	7.8069	0.03903
FU1354944--	DISPENSING - GROUNDS- GASOLINE	944 1634044	METHYL TERT-BUTYL ETHER	0.344	0.00172
FU1354945--	DISPENSING - FD4109.1 - GASOLINE	945 1634044	METHYL TERT-BUTYL ETHER	0.2557	0.00103
Sum CAS: 1634044				165.1747	0.082587

[FU1354938-...]	DISPENSING - FD1369.1-2.-4. - JP-8	943 2092664	0.0838	0.000017
[FU1354947-...]	DISPENSING - FD1344 - JP-8	947 2092664	0.0211	0.000011
	Sum CAS: 2092664	0.0549	0.000028	
[FU1354938-...]	DISPENSING - FD6200 - GAS	938 540841	23.8636	0.011932
[FU1354939-...]	DISPENSING - FD1310.1 - MOGAS	939 540841	1.188	0.000594
[FU1354940-...]	DISPENSING - FD1310.2 - DIESEL	940 540841	2.057	0.001029
[FU1354942-...]	DISPENSING - FD1369.3 - DIESEL	942 540841	0.0199	0.00001
[FU1354943-...]	DISPENSING - FD1369.1-2.-4. - JP-8	943 540841	0.0338	0.000017
[FU1354946-...]	DISPENSING - GROUNDS- GASOLINE	1346 540841	0.562	0.000281
[FU1354947-...]	DISPENSING - GROUNDS- DIESEL	944 540841	0.0523	0.000026
[FU1354951-...]	DISPENSING - FD109.1 - GASOLINE	945 540841	0.0313	0.000016
[FU1354948-...]	DISPENSING - FD109.2 - DIESEL	946 540841	0.0275	0.000014
[FU1354949-...]	DISPENSING - FD1344 - JP-8	947 540841	0.0211	0.000011
[FU1354950-...]	DISPENSING - FDLANDFILL - DIESEL	951 540841	0.1398	0.00007
	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948 540841	0.1556	0.000078
	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949 540841	0.0186	0.000009
	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950 540841	0.01	0.000005
	Sum CAS: 540841	28.1805	0.014092	
[FU1354938-...]	DISPENSING - FD6200 - GAS	938 7432	20.4545	0.010227
[FU1354939-...]	DISPENSING - FD1310.1 - MOGAS	939 7432	0.1035	0.000509
[FU1354940-...]	DISPENSING - FD1310.2 - DIESEL	940 7432	6.4393	0.00322
[FU1354942-...]	DISPENSING - FD1369.3 - DIESEL	942 7432	0.0623	0.000031
[FU1354943-...]	DISPENSING - FD1369.1-2.-4. - JP-8	943 7432	0.3378	0.000169
[FU1354946-...]	DISPENSING - GROUNDS- DIESEL	1346 7432	1.7594	0.00088
[FU1354947-...]	DISPENSING - GROUNDS- GASOLINE	944 7432	0.0449	0.000022
[FU1354951-...]	DISPENSING - FD109.1 - GASOLINE	945 7432	0.0268	0.000013
[FU1354948-...]	DISPENSING - FD109.2 - DIESEL	946 7432	0.086	0.000043
[FU1354949-...]	DISPENSING - FD1344 - JP-8	947 7432	0.2106	0.000105
[FU1354950-...]	DISPENSING - FDLANDFILL - DIESEL	951 7432	0.4375	0.000219
	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948 7432	1.5563	0.000778
	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949 7432	0.1961	0.000093
	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950 7432	0.0996	0.000005
	Sum CAS: 7432	32.7194	0.016359	
[FU1354938-...]	DISPENSING - FD6200 - GAS	938 91203	0	0
[FU1354939-...]	DISPENSING - FD1310.1 - MOGAS	939 91203	0	0
[FU1354943-...]	DISPENSING - FD1369.1-2.-4. - JP-8	943 91203	0.6419	0.000321
[FU1354944-...]	DISPENSING - GROUNDS- GASOLINE	944 91203	0	0
[FU1354945-...]	DISPENSING - FD109.1 - GASOLINE	945 91203	0	0
[FU1354947-...]	DISPENSING - FD1344 - JP-8	947 91203	0.4001	0.0002
[FU1354948-...]	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948 91203	2.9569	0.001478
[FU1354949-...]	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949 91203	0.3536	0.000177
[FU1354950-...]	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950 91203	0.1893	0.000095
	Sum CAS: 91203	4.5418	0.002271	

IFU1354943---	DISPENSING - FD1369.1-2-4 - JP-8	943 95476	O-XYLENE	2.7196	0.00136
IFU1354947---	DISPENSING - FD1344 - JP-8	947 95476	O-XYLENE	1.695	0.000848
IFU1354948---	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948 95476	O-XYLENE	12.5279	0.006264
IFU1354949---	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949 95476	O-XYLENE	1.498	0.000749
IFU1354950---	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950 95476	O-XYLENE	0.8018	0.000401
			Sum CAS: 95476	19.2423	0.009622
IFU1354938---	DISPENSING - FD6220 - GAS	938 98828	CUMENE	0.6818	0.000341
IFU1354939---	DISPENSING - FD1310.1 - MOGAS	939 98828	CUMENE	0.0339	0.000017
IFU1354940---	DISPENSING - FD1310.2 - DIESEL	940 98828	CUMENE	0.3577	0.000179
IFU1354942---	DISPENSING - FD1369.3 - DIESEL	942 98828	CUMENE	0.0035	0.000002
IFU1354943---	DISPENSING - FD1369.1-2-4 - JP-8	943 98828	CUMENE	0.4899	0.00245
IFU13541346--GRD-DIE	DISPENSING - GROUNDS-DIESEL	1346 98828	CUMENE	0.0977	0.000049
IFU1354944---	DISPENSING - GROUNDS-GASOLINE	944 98828	CUMENE	0.0015	0.000001
IFU1354945---	DISPENSING - FD4109.1 - GASOLINE	945 98828	CUMENE	0.0009	0
IFU1354946---	DISPENSING - FD4109.2 - DIESEL	946 98828	CUMENE	0.0048	0.000002
IFU1354947---	DISPENSING - FD1344 - JP-8	947 98828	CUMENE	0.3053	0.000153
IFU1354951---	DISPENSING - FDLANDFILL - DIESEL	951 98828	CUMENE	0.0243	0.000012
IFU1354948---	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948 98828	CUMENE	2.2566	0.001128
IFU1354949---	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949 98828	CUMENE	0.2698	0.000135
IFU1354950---	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950 98828	CUMENE	0.1444	0.000072
			Sum CAS: 98828	4.6721	0.002336

2005 Potential Emissions

Table D-5

Calculation Name: FUEL DISPENSING

Process ID	Process Name	Unique Process ID	CAS No.	Chem. Name	Emissions (LBS)	Emissions (Ton)
IFU1354938-**	DISPENSING - FD6200 - GAS	938	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	4090.91	2.045
IFU1354939-**	DISPENSING - FD1310.1 - MOGAS	939	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	714.50	0.357
IFU1354940-**	DISPENSING - FD1310.2 - DIESEL	940	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	376.52	0.188
IFU1354942-**	DISPENSING - FD1369.3 - DIESEL	942	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	1.30	0.001
IFU1354943-**	DISPENSING - FD1369.1-2-4 - JP-8	943	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	253.38	0.127
IFU13541343-GRD-DIE	GROUND-S-DIESEL	1346	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	102.88	0.051
IFU1354944-**	DISPENSING - GROUNDS- GASOLINE	944	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	31.48	0.016
IFU1354945-**	DISPENSING - FD4109.1 - GASOLINE	945	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	18.82	0.009
IFU1354946-**	DISPENSING - FD4109.2 - DIESEL	946	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	5.03	0.003
IFU1354947-**	DISPENSING - FD1344 - JP-8	947	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	296.89	0.148
IFU1354951-**	DISPENSING - FDLANDFILL - DIESEL	951	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	25.58	0.013
IFU1354948-**	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	1167.19	0.584
IFU1354949-**	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	139.56	0.070
IFU1354950-**	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	74.71	0.037
				Sum CAS: VOC	7298.74	3.649

2005 HAP Potential Emissions

Table D-6

Calculation Name: FUEL DISPENSING

Process ID	Process Name	Unique Process ID	CAS No.	Chem. Name	Emissions (LBS)	Emissions (Ton)
IFU1354938---	DISPENSING - FD6200 - GAS	938	100414	ETHYLBENZENE	1.64	0.001
IFU1354939---	DISPENSING - FD1310.1 - MOGAS	939	100414	ETHYLBENZENE	0.29	0.000
IFU1354940---	DISPENSING - FD1310.2 - DIESEL	940	100414	ETHYLBENZENE	2.64	0.001
IFU1354942---	DISPENSING - FD1399.3 - DIESEL	942	100414	ETHYLBENZENE	0.01	0.000
IFU1354943---	DISPENSING - FD1369.1-2-4 - JP-8	943	100414	ETHYLBENZENE	2.18	0.001
IFU13541346-GRD-DIESEL	DISPENSING - GROUNDS- GASOLINE	1346	100414	ETHYLBENZENE	0.72	0.000
IFU1354944---	DISPENSING - FD4109.1 - GASOLINE	944	100414	ETHYLBENZENE	0.01	0.000
IFU1354945---	DISPENSING - FD4109.2 - DIESEL	945	100414	ETHYLBENZENE	0.01	0.000
IFU1354946---	DISPENSING - FD1344 - JP-8	946	100414	ETHYLBENZENE	0.04	0.000
IFU1354947---	DISPENSING - FDLANDFILL - DIESEL	947	100414	ETHYLBENZENE	2.55	0.001
IFU1354951---	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	951	100414	ETHYLBENZENE	0.18	0.000
IFU1354948---	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	948	100414	ETHYLBENZENE	10.04	0.005
IFU1354949---	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	949	100414	ETHYLBENZENE	1.20	0.001
IFU1354950---	DISPENSING - FD1369.1-2-4 - JP-8	950	100414	ETHYLBENZENE	0.64	0.000
	Sum CAS: 100414				22.13	0.011
IFU1354943---	DISPENSING - FD1369.1-2-4 - JP-8	943	106423	P-XYLENE	1.80	0.001
IFU1354947---	DISPENSING - FD1344 - JP-8	947	106423	P-XYLENE	2.11	0.001
IFU1354948---	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948	106423	P-XYLENE	8.29	0.004
IFU1354949---	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949	106423	P-XYLENE	0.99	0.000
IFU1354950---	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950	106423	P-XYLENE	0.53	0.000
	Sum CAS: 106423				13.72	0.007
IFU1354943---	DISPENSING - FD1369.1-2-4 - JP-8	943	108383	M-XYLENE	6.13	0.003
IFU1354947---	DISPENSING - FD1344 - JP-8	947	108383	M-XYLENE	7.18	0.004
IFU1354948---	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948	108383	M-XYLENE	28.25	0.014
IFU1354949---	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949	108383	M-XYLENE	3.38	0.002
IFU1354950---	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950	108383	M-XYLENE	1.81	0.001
	Sum CAS: 108383				46.75	0.023

[FU1354938-...]	DISPENSING - FD6200 - GAS	938 108883	TOLUENE	28.64	0.014
[FU1354939-...]	DISPENSING - FD1310.1 - MOGAS	939 108883	TOLUENE	5.00	0.003
[FU1354940-...]	DISPENSING - FD1310.2 - DIESEL	940 108883	TOLUENE	15.44	0.008
[FU1354942-...]	DISPENSING - FD1369.3 - DIESEL	942 108883	TOLUENE	0.05	0.000
[FU1354943-...]	DISPENSING - FD1369.1-2-4 - JP-8	943 108883	TOLUENE	4.18	0.002
[FU13541348-GRD-DIE]	GROUND-S-DIESEL	1346 108883	TOLUENE	4.22	0.002
[FU1354944-...]	DISPENSING - GROUNDS- GASOLINE	944 108883	TOLUENE	0.22	0.000
[FU1354945-...]	DISPENSING - FD4199.1 - GASOLINE	945 108883	TOLUENE	0.13	0.000
[FU1354946-...]	DISPENSING - FD4199.2 - DIESEL	946 108883	TOLUENE	0.21	0.000
[FU1354947-...]	DISPENSING - FD1344 - JP-8	947 108883	TOLUENE	4.90	0.002
[FU1354951-...]	DISPENSING - FDLANDFILL - DIESEL	951 108883	TOLUENE	1.05	0.001
[FU1354948-...]	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948 108883	TOLUENE	19.26	0.010
[FU1354949-...]	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949 108883	TOLUENE	2.30	0.001
[FU1354950-...]	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950 108883	TOLUENE	1.23	0.001
	Sum CAS: 108883			86.83	0.043
			HEXANE	20.45	0.010
		938 110543	HEXANE	3.57	0.002
		939 110543	HEXANE	2.13	0.001
		943 110543	HEXANE	0.16	0.000
		944 110543	HEXANE	0.09	0.000
		945 110543	HEXANE	2.49	0.001
		947 110543	HEXANE	9.80	0.005
		948 110543	HEXANE	1.17	0.001
		949 110543	HEXANE	0.63	0.000
		950 110543	HEXANE	40.51	0.020
	Sum CAS: 110543				
			XYLENE (MIXED)	8.18	0.004
		938 1330207	XYLENE (MIXED)	1.43	0.001
		939 1330207	XYLENE (MIXED)	9.41	0.005
		940 1330207	XYLENE (MIXED)	0.03	0.000
		942 1330207	XYLENE (MIXED)	12.01	0.006
		943 1330207	XYLENE (MIXED)	2.57	0.001
		1346 1330207	XYLENE (MIXED)	0.06	0.000
		944 1330207	XYLENE (MIXED)	0.04	0.000
		945 1330207	XYLENE (MIXED)	0.13	0.000
		946 1330207	XYLENE (MIXED)	14.07	0.007
		947 1330207	XYLENE (MIXED)	0.64	0.000
		951 1330207	XYLENE (MIXED)	48.58	0.024
	Sum CAS: 1330207				

IFU1354938----	DISPENSING - FD6200 - GAS	938 1634044	METHYL TERT-BUTYL ETHER	188.18	0.094
IFU1354939----	DISPENSING - FD1310.1 - MOGAS	939 1634044	METHYL TERT-BUTYL ETHER	32.87	0.016
IFU1354940----	DISPENSING - GROUNDS- GASOLINE	940 1634044	METHYL TERT-BUTYL ETHER	1.45	0.001
IFU1354941----	DISPENSING - FD4109.1 - GASOLINE	941 1634044	METHYL TERT-BUTYL ETHER	0.87	0.000
IFU1354945----	Sum CAS: 1634044	945 1634044	METHYL TERT-BUTYL ETHER	223.36	0.112
IFU1354938----	DISPENSING - FD6200 - GAS	938 540841	2,2,4-TRIMETHYLPENTANE	28.64	0.014
IFU1354939----	DISPENSING - FD1310.1 - MOGAS	939 540841	2,2,4-TRIMETHYLPENTANE	5.00	0.003
IFU1354940----	DISPENSING - FD1310.2 - DIESEL	940 540841	2,2,4-TRIMETHYLPENTANE	8.66	0.004
IFU1354942----	DISPENSING - FD1369.3 - DIESEL	942 540841	2,2,4-TRIMETHYLPENTANE	0.03	0.000
IFU1354946----	DISPENSING - FD1369.1-2-4 - JP-8	943 540841	2,2,4-TRIMETHYLPENTANE	0.05	0.000
IFU13541346--GRD-DIESEL	DISPENSING - GROUNDS- DIESEL	1346 540841	2,2,4-TRIMETHYLPENTANE	2.37	0.001
IFU1354944----	DISPENSING - GROUNDS- GASOLINE	944 540841	2,2,4-TRIMETHYLPENTANE	0.22	0.000
IFU1354945----	DISPENSING - FD4109.1 - GASOLINE	945 540841	2,2,4-TRIMETHYLPENTANE	0.13	0.000
IFU1354946----	DISPENSING - FD4109.2 - DIESEL	946 540841	2,2,4-TRIMETHYLPENTANE	0.12	0.000
IFU1354947----	DISPENSING - FD1344 - JP-8	947 540841	2,2,4-TRIMETHYLPENTANE	0.06	0.000
IFU1354951----	DISPENSING - FDLANDFILL - DIESEL	951 540841	2,2,4-TRIMETHYLPENTANE	0.59	0.000
IFU1354948----	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948 540841	2,2,4-TRIMETHYLPENTANE	0.23	0.000
IFU1354949----	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949 540841	2,2,4-TRIMETHYLPENTANE	0.03	0.000
IFU1354950----	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950 540841	2,2,4-TRIMETHYLPENTANE	0.02	0.000
IFU1354938----	Sum CAS: 540841		Sum CAS: 540841	46.14	0.023
IFU1354939----	DISPENSING - FD6200 - GAS	938 71432	BENZENE	24.55	0.012
IFU1354940----	DISPENSING - FD1310.1 - MOGAS	939 71432	BENZENE	4.29	0.002
IFU1354942----	DISPENSING - FD1310.2 - DIESEL	940 71432	BENZENE	27.11	0.014
IFU1354946----	DISPENSING - FD1369.3 - DIESEL	942 71432	BENZENE	0.09	0.000
IFU13541346--GRD-DIESEL	DISPENSING - FD1369.1-2-4 - JP-8	943 71432	BENZENE	0.51	0.000
IFU1354944----	DISPENSING - GROUNDS- GASOLINE	1346 71432	BENZENE	7.41	0.004
IFU1354945----	DISPENSING - FD4109.1 - GASOLINE	944 71432	BENZENE	0.19	0.000
IFU1354946----	DISPENSING - FD4109.2 - DIESEL	945 71432	BENZENE	0.11	0.000
IFU1354947----	DISPENSING - FD1344 - JP-8	946 71432	BENZENE	0.36	0.000
IFU1354951----	DISPENSING - FDLANDFILL - DIESEL	947 71432	BENZENE	0.59	0.000
IFU1354948----	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948 71432	BENZENE	1.84	0.001
IFU1354949----	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949 71432	BENZENE	2.33	0.000
IFU1354950----	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950 71432	BENZENE	0.28	0.000
IFU1354945----	Sum CAS: 71432		Sum CAS: 71432	69.81	0.035

IFU1354938----	DISPENSING - FD6200 - GAS	938 91203	NAPHTHALENE	0.00	0.0000
IFU1354939----	DISPENSING - FD1310.1 - MOGAS	939 91203	NAPHTHALENE	0.00	0.0000
IFU1354940----	DISPENSING - FD1369.1-2-.4 - JP-8	940 91203	NAPHTHALENE	0.96	0.0005
IFU1354943----	DISPENSING - GROUNDS- GASOLINE	944 91203	NAPHTHALENE	0.00	0.0000
IFU1354944----	DISPENSING - FD4109.1 - GASOLINE	945 91203	NAPHTHALENE	0.00	0.0000
IFU1354945----	DISPENSING - FD1344 - JP-8	947 91203	NAPHTHALENE	0.60	0.0003
IFU1354947----	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948 91203	NAPHTHALENE	4.44	0.0022
IFU1354948----	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949 91203	NAPHTHALENE	0.53	0.0003
IFU1354949----	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950 91203	NAPHTHALENE	0.28	0.0001
			Sum CAS: 91203	6.81	0.0034
IFU1354943----	DISPENSING - FD1369.1-2-.4 - JP-8	943 95476	O-XYLENE	4.08	0.002
IFU1354947----	DISPENSING - FD1344 - JP-8	947 95476	O-XYLENE	2.54	0.001
IFU1354948----	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948 95476	O-XYLENE	18.79	0.009
IFU1354949----	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949 95476	O-XYLENE	2.25	0.001
IFU1354950----	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950 95476	O-XYLENE	1.20	0.001
			Sum CAS: 95476	28.86	0.014
IFU1354938----	DISPENSING - FD6200 - GAS	938 98828	CUMENE	0.82	0.0004
IFU1354939----	DISPENSING - FD1310.1 - MOGAS	939 98828	CUMENE	0.14	0.0001
IFU1354940----	DISPENSING - FD1310.2 - DIESEL	940 98828	CUMENE	1.51	0.0008
IFU1354942----	DISPENSING - FD1369.3 - DIESEL	942 98828	CUMENE	0.01	0.0000
IFU1354943----	DISPENSING - FD1369.1-2-.4 - JP-8	943 98828	CUMENE	0.73	0.0004
IFU1354946----	DISPENSING - GROUNDS- GASOLINE	946 98828	CUMENE	0.41	0.0002
IFU1354945----	DISPENSING - FD4109.1 - GASOLINE	945 98828	CUMENE	0.01	0.0000
IFU1354946----	DISPENSING - FD4109.2 - DIESEL	946 98828	CUMENE	0.00	0.0000
IFU1354947----	DISPENSING - FD1344 - JP-8	947 98828	CUMENE	0.02	0.0000
IFU1354951----	DISPENSING - FDLANDFILL - DIESEL	951 98828	CUMENE	0.86	0.0004
IFU1354948----	DISPENSING - FDAIRCRAFT.1 - JP-8 - TRUCKS	948 98828	CUMENE	3.38	0.0017
IFU1354949----	DISPENSING - FDAIRCRAFT.2 - JP-8 - HYDRANTS	949 98828	CUMENE	0.40	0.0002
IFU1354950----	DISPENSING - FDAIRCRAFT.3 - JP-8 - DEFUELING	950 98828	CUMENE	0.22	0.0001
			Sum CAS: 98828	8.62	0.0043

Number of Fuel Loading Racks Identified: 3

Emission Source Type:
Stationary

Emission Source ID: FD

AA.1 Background

Fuel loading racks are used for the bulk transfer of fuel into tanker trucks for distribution. For Mountain Home AFB, this operation is carried out at one location, the POL loading racks. The loading method is top-fill submerged fill pipe. A summary of actual fuel rack throughputs for CY 2005 is provided in Table AA-1. Fuel loading data is included with the Fuel Transfer/Dispensing data in Appendix AAA-1.

AA.2 Emission Calculation Method

VOC and HAP emissions from fuel loading racks were calculated based on emission factors obtained from the APIMS standard code FLD-01 and the *Air Emissions Inventory Guidance Document for Stationary Sources at Air Force Installations* (USAF IERA 1999 and 2001). Fuel loading rack HAP speciation for JP-8, Diesel, and Mogas were calculated by the weight fraction in the vapor phase in Table AA-2.

AA.3 Sample Calculations

AA.3.1 VOC Calculations

VOC emissions from fuel transfer operations were calculated by multiplying the amount of fuel loaded by the loading loss:

$$\text{VOC} = F * S * 0.01246 * VP * MW / T$$

where:

F = Quantity of Fuel transferred;

S = Saturation Factor (0.6 lb/lb) for submerged fill with no vapor recovery

0.01246 = Constant $\left(\frac{\text{lb-mole} - ^\circ R}{\text{gal-psia}} \right)$

T = Temperature of bulk liquid loaded ($52^\circ\text{F} = 512^\circ\text{R}$);

VP = Vapor Pressure of JP-8 (0.02 psia);

MW = Molecular weight of vapors (130 lb/lb-mole for JP-8);

The following equation is an example emission calculation for the transfer of JP-8 to aircraft:

AA. Fuel Loading

$$E_{VOC} = \left(22,986,719 \frac{\text{gals}}{\text{yr}} \right) (0.6) \left[(0.01246)(0.02\text{psia}) \left(130 \frac{\text{lbs}}{\text{lb-mole}} \right) / 5120 \text{R} \right] = 873 \frac{\text{lbs}}{\text{yr}}$$

AA.3.2 Toluene Calculations

Toluene emissions were calculated by multiplying total VOC emissions from JP-8 operation (873 lbs/year) by the weight fraction of toluene in the vapor phase.

$$E_{Toluene} = \left(873 \frac{\text{lbs}}{\text{yr}} \right) \left(\frac{1.65}{100} \right) = 14.4 \text{ lbs/yr}$$

AA.4 Actual Emissions Summary

The APIMS actual VOC emissions from fuel loading racks are presented in Table AA-3. The actual HAP emissions are summarized in Table AA-4.

AA.5 Potential Emissions Summary

Potential emission estimates are based on potential increases from fuel loading racks ($K_{p/a} = 1.5$). The APIMS Process ID and potential annual VOC emissions are presented in Table AA-5. The potential HAP emissions are summarized in Table AA-6.

**Table AA-1
2005 ACTUAL ANNUAL VOC EMISSIONS FROM FUEL
LOADING RACK OPERATIONS**

Emission Source ID	Product	CAS No.	Throughput (gal/yr)
FD1317.1	JP-8	JP8	22,986,719
FD1317.2	Gasoline	8006619	98,440
FD1317.3	Diesel	DIST	123,907

Table AA-2
FUEL LOADING HAP EMISSION SPECIATION

HAP	CAS No.	Volatile Speciation by Wt Percent (%) ¹		
		JP-8	Mogas	Diesel
Ethylbenzene	100-41-4	0.86	0.04	0.7
P-Xylene	106-42-3	0.71	0	0
M-Xylene	108-38-3	2.42	0	0
Toluene	108-88-3	1.65	0.7	4.1
Hexane	110-54-3	0.84	0.5	0
2,2,4-Trimethylpentane	540-84-1	0.02	0.7	2.3
Benzene	71-43-2	0.2	0.6	7.2
Naphthalene	91-20-3	0.38	0	0
O-Xylenes	95-47-6	1.61	0	0
Cumene	98-82-8	0.29	0.02	0.4
Xylene (mixed)	1330-20-7	0	0.2	2.5
MTBE	1634-04-4	0	4.6	0

Note:

¹ Volatile Speciation for Mogas and Diesel based on Air Emissions Inventory Guidance Document for Stationary Sources at Air Force Installations (USAF Institute for Environment, Safety, and Occupational Risk Analysis, 1999).

Volatile Speciation for JP-8 based on Air Emissions Inventory Guidance Document for Stationary Sources at Air Force Installations (USAF Institute for Environment, Safety, and Occupational Risk Analysis, 2001).

2005 Actual Emissions

Table AA-3

Calculation Name: FUEL LOADING

Process ID	Process Name	Unique Process ID	CAS No.	Chem. Name	Emissions (LBS)	Emissions (Ton)
IFU1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 VOC		VOLATILE ORGANIC COMPOUNDS (VOC)	1,7416	0.000871
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 VOC		VOLATILE ORGANIC COMPOUNDS (VOC)	493.6262	0.246813
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 VOC		VOLATILE ORGANIC COMPOUNDS (VOC)	873.2321	0.436616
	Sum CAS: VOC				1368.5999	0.6843

2005 HAP Actual Emissions

Table AA-4

Calculation Name: FUEL LOADING

Process ID	Process Name	Unique Process ID	CAS No.	Chem. Name	Emissions (LBS)	Emissions (Ton)
IFU1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 100414		ETHYLBENZENE	0.0007	0
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 100414		ETHYLBENZENE	0.1975	0.000099
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 100414		ETHYLBENZENE	7.5098	0.003755
				Sum CAS: 100414	7.708	0.003854
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 106423		P-XYLENE	6.1999	0.0031
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 108383		M-XYLENE	21.1322	0.010566
IFU1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 108883		TOLUENE	0.0122	0.000006
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 108883		TOLUENE	3.4554	0.0011728
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 108883		TOLUENE	14.4083	0.007204
				Sum CAS: 108883	17.8759	0.008938
IFU1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 110543		HEXANE	0.0087	0.000004
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 110543		HEXANE	2.4681	0.001234
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 110543		HEXANE	7.3351	0.003668
				Sum CAS: 110543	9.8119	0.004906
IFU1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 1330207		XYLENE (MIXED)	0.0035	0.000002
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 1330207		XYLENE (MIXED)	0.9873	0.00494
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317			Sum CAS: 1330207	0.9998	0.00496
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 1634044		METHYL TERT-BUTYL ETHER	22.7068	0.011353
IFU1355935---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 540841		2,2,4-TRIMETHYLPENTANE	3.4554	0.001728
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 540841		2,2,4-TRIMETHYLPENTANE	0.1746	0.000087
				Sum CAS: 540841	3.63	0.001815
IFU1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 71432		BENZENE	0.1254	0.000063
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 71432		BENZENE	2.9618	0.001481
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 71432		BENZENE	1.7465	0.000873
				Sum CAS: 71432	4.8337	0.002417
IFU1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 91203		NAPHTHALENE	0	0
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 91203		NAPHTHALENE	0	0
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 91203		NAPHTHALENE	3.3183	0.001659
				Sum CAS: 91203	3.3183	0.001659

IFU1355935...FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 95476	OXYYLENE			14.059	0.00703
IFU1355937...FD13173	FUEL LOADING OF DIESEL AT B/1317	937 98828	CUMENE			0.0003	0
IFU1355936...FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 98828	CUMENE			0.0987	0.000049
IFU1355935...FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 98828	CUMENE			2.5324	0.001266
			Sum CAS: 98828			2.6314	0.001315

2005 Potential Emissions

Table AA-5

Calculation Name: FUEL LOADING

Process ID	Process Name	Unique Process ID	CAS No	Chem. Name	Emissions (LBS)	Emissions (Ton)
IFU1355937...FD13173	FUEL LOADING OF DIESEL AT B/1317	937	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	2,6124	0.0013065
IFU1355936...FD13172	FUEL LOADING OF GASOLINE AT B/1317	936	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	740.4393	0.3702195
IFU1355935...FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935	VOC	VOLATILE ORGANIC COMPOUNDS (VOC)	1309.84815	0.654924
	Sum CAS: VOC				2052.89985	1.02645

2005 HAP Potential Emissions

Table AA-6

Calculation Name: FUEL LOADING

Process ID	Process Name	Unique Process ID	CAS No.	Chem. Name	Emissions (LBS)	Emissions (Ton)
IFU1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 100414		ETHYL BENZENE	0.00105	0
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 100414		ETHYL BENZENE	0.29625	0.0001485
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 100414		ETHYL BENZENE	11.2647	0.0056325
	Sum CAS: 100414				11.562	0.005781
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 106423		P-XYLENE	9.29985	0.00465
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 108883		M-XYLENE	31.6983	0.015849
IFU1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 108883		TOLUENE	0.0183	0.000009
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 108883		TOLUENE	5.1831	0.002592
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 108883		TOLUENE	21.61245	0.010806
	Sum CAS: 108883				26.81385	0.013407
IFU1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 110434		HEXANE	0.01305	0.000006
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 110434		HEXANE	3.70215	0.001851
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 110434		HEXANE	11.00265	0.005502
	Sum CAS: 110434				14.71785	0.007359
IFU1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 1330207		XYLENE (MIXED)	0.00525	0.000003
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 1330207		XYLENE (MIXED)	1.48095	0.000741
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317			Sum CAS: 1330207	1.4862	0.000744
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 1634044		METHYL TERT-BUTYL ETHER	34.0602	0.0170295
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 540841		2,2,4-TRIMETHYLPENTANE	5.1831	0.002592
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 540841		2,2,4-TRIMETHYLPENTANE	0.2619	0.0001305
	Sum CAS: 540841				5.445	0.0027225
IFU1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 71432		BENZENE	0.1881	0.0000945
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 71432		BENZENE	4.4427	0.0022215
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 71432		BENZENE	2.61975	0.0013095
	Sum CAS: 71432				7.25055	0.0036255
IFU1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 91203		NAPHTHALENE	0	0
IFU1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 91203		NAPHTHALENE	0	0
IFU1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 91203		NAPHTHALENE	4.97745	0.0024885
	Sum CAS: 91203				4.97745	0.0024885

1 FU 1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 954.6	O-XYLENE	21.0886	0.010545
2 FU 1355937---FD13173	FUEL LOADING OF DIESEL AT B/1317	937 98828	CUMENE	0.00045	0
3 FU 1355936---FD13172	FUEL LOADING OF GASOLINE AT B/1317	936 98828	CUMENE	0.14805	0.0000735
4 FU 1355935---FD13171	FUEL LOADING OF JP-8 AT BUILDING 1317	935 98828	CUMENE	3.7986	0.001899
			Sum CAS: 98828	3.9471	0.0019725

Appendix D.2
Aboveground Storage Tanks

Number of Aboveground
Tanks Identified: 156

Emission Source Type:
Stationary

Emission Source ID: AT

E.1 Background

E.1.1 General

For purposes of this report, ASTs are defined as stationary vessels having a majority of their storage capacity above ground.

ASTs at Mountain Home AFB were grouped as follows based on their function and fuel stored:

ASTs Associated with Basewide Fuels Distribution.

Gasoline received by the base via tanker truck is initially stored in two 10,000-gallon ASTs (AT1303.1 and AT1303.2). This operation does not include gasoline for the AAFES Gas Station. Diesel received by the base is stored in one 30,000-gallon AST (AT1304.1). JP-8 is stored in three 1,500,000-gallon ASTs by way of pipeline. The filling type is submerged. These tanks have a pressure vent with a setting of 3 pounds per square inch (psi).

ASTs Associated with the AAFES Gas Station.

Gasoline delivered via tanker truck is stored in three 10,000-gallon ASTs (AT6200.1, AT6200.2, and AT6200.3). The tanks are filled using Stage I vapor recovery methods.

ASTs Associated with Refueling Operations.

Refueling of base vehicles is conducted on base at the vehicle refueling station, which has three 6,000-gallon ASTs. Two ASTs (AT1310.1 and AT1310.2) are used for gasoline, and one AST (AT1310.3) is used for diesel. These tanks have a pressure vent with a 3-psi setting. The Aerospace Ground Equipment (AGE) operations maintain a refueling station with four dispensers (FD1369.1, FD1369.2, FD1369.3, and FD1369.4), which utilize a three-compartment AST (AT1359.1, AT1359.2, and AT1359.3). Two compartments have a capacity of 5,000 gallons each for gasoline and JP-8 storage and the third compartment has a 10,000-gallon capacity for JP-8 storage.

ASTs Associated with Boilers/Furnaces and Stationary Emergency Generators/Fire Pumps (Internal Combustion Engines).

Throughput for each of these tanks was assumed to be equal to the capacity of the tank.

- **Diesel ASTs.** These tanks were divided into two groups:
 - **ASTs less than 2,500 gallons.** There are 126 ASTs ranging from 85 to 2,500 gallons.
 - **ASTs greater than 2,500 gallons.** There are 30 ASTs ranging from 5,000 to 1,500,000 gallons.

- **Fuel Oil ASTs.** There are five ASTs containing No. 1 Fuel oil.
- **AST Associated with Deicing Operations.** There were seven ASTs (AT1100.3A, AT1100.3B, AT1306.1, AT1306.2, 1296.11, 1359.6, and 2209.1) used on base for storage of propylene glycol and used antifreeze. The propylene glycol throughput for CY 2005 was divided between these tanks.
- **Used Oil and Miscellaneous ASTs.** Approximately 49 tanks scattered throughout the base are used to store hydraulic oil, engine oil, transmission fluid, 1010 oil, 15W40 oil, and 100 additive collect used oil.

The average tank temperature was assumed to be the average annual ambient temperature at the base (52 F) for 2005. Summaries of ASTs are presented in Table E-1.

E.2 Emission Calculation Method

VOC emissions were calculated using the APIMS Tanks Program incorporated from TANKS 4.03 program (EPA 1999). HAP emissions were calculated based on emission factors obtained from the *Air Emissions Inventory Guidance Document for Stationary Sources at Air Force Installations* (USAF IERA 1999 and 2001 amendment for JP-8 Liquid Phase Speciation), Table E-2.

VOC emissions from gasoline ASTs were calculated using Reid Vapor Pressure (RVP) = 9.

Aboveground storage tanks experience two types of losses: standing storage losses and working losses. The potential and actual emissions from standing storage losses will be equivalent since these losses are a function of the size and type of tank and not a function of throughput.

A control efficiency of 90% was applied to working losses of the gasoline ASTs at the AAFES station, which are loaded using Stage I (vapor recovery) controls.

E.3 Sample Calculations

An example of the basic AST calculations is:

- 10,000-gallon gasoline AST (facility POLSTOR, Emission Source ID AT1303.1);
- Shell/roof paint color: beige;

E. Aboveground Storage Tanks

- Type of filling: submerged; and
- Pressure setting: 3 psia.
- Throughput = $23,143 \frac{\text{gals}}{\text{yr}}$ (gasoline)
- Toluene weight percent = 0.7.

E.3.1 VOC Calculations

VOC emissions were calculated using the TANKS 4.03 program.

$$\text{VOC} = 1,958.14 \frac{\text{lbs}}{\text{yr}}$$

E.3.2 Toluene Calculations

Toluene emissions were derived from the weight percent of toluene in gasoline.

$$\text{Toluene} = (\text{Toluene vapor wt \%}) (\text{VOC emissions})$$

$$\text{Toluene} = \left(\frac{0.7}{100} \right) \left(1,958.14 \frac{\text{lbs}}{\text{yr}} \right) = 13.71 \frac{\text{lbs}}{\text{yr}}$$

E.4 Actual Emissions Summary

Actual annual VOC and HAP emission tables were summarized by material stored. The APIMS Tank program estimated actual HAP and VOC emissions based on the number of turnovers from each AST summarized in Table E-3.

E.5 Potential Emissions Summary

Potential VOC and HAP emissions were assumed to equal actual emissions (based on conservative number of tank turnovers per year).

Table E-1
SUMMARY OF ASTs FOR CY 2005

Emission Source ID	Location	Facility	Capacity (gal)	Throughput (gal)	Turnovers (per year)	Material Stored
AT196.1	BLDG 196.1 - Gen	AMXS/MXG	350	350	1.00	diesel
AT197.1	BLDG 197	34BS	550	550	1.00	diesel
AT197.2	BLDG 197-Gen	34BS	550	550	1.00	diesel
AT197.3	BLDG 197	34BS	550	550	1.00	diesel
AT197.4	BLDG 197	34BS	550	550	1.00	diesel
AT197.5	BLDG 197	34BS	150	150	1.00	diesel
AT200	BLDG 200	FUELSYSREP	1,000	1000	1.00	purgung fluid
AT204	BLDG 204	389FS	250	250	1.00	used oil
AT205.1	BLDG 205	726 ACS	250	250	1.00	used oil
AT205.2	BLDG 205	726 ACS	85	85	1.00	used mixed fuel
AT206.1	BLDG 206-Gen	FIRE STA 1	600	600	1.00	diesel
AT206.2	BLDG 206	FIRE STA 1	250	250	1.00	used oil
AT211.1	BLDG 211	MAINTDOC	250	250	1.00	used oil
AT211.2	BLDG 211	MAINTDOC	250	250	1.00	used JP-8
AT211.3	BLDG 211	MAINTDOC	145	145	1.00	diesel
AT259	BLDG 259-Gen	BASEOPSWTH	300	300	1.00	diesel
AT264	BLDG 264-Gen	PWRSTABLDG	1200	1200	1.00	diesel
AT265	BLDG 265-Gen	PUMPSTA	350	350	1.00	diesel
AT268	BLDG 268	FIRETRAINPIT	2,000	2000	1.00	JP-8
AT270.1	BLDG 270	HUSHHSE2	2,500	2500	1.00	JP-8
AT270.2	BLDG 270	HUSHHSE2	250	250	1.00	used JP-8
AT270.3	BLDG 270	HUSHHSE2	250	250	1.00	used oil
AT270.4	BLDG 270	HUSHHSE2	250	250	1.00	1010 oil
AT315.1	BLDG 315	RSMAIN	660	660	1.00	No. 1 fuel oil
AT315.2	BLDG 315	RSMAIN	250	250	1.00	used oil
AT508	BLDG 508-Gen	PWRSTABL	1000	1000	1.00	diesel
AT517	BLDG 517 - Gen	SEWERLIFT 1	150	150	1.00	diesel
AT603	BLDG 603	RECSUPP	250	250	1.00	used oil
AT610	BLDG 610-Gen	COMMFACT	1100	1100	1.00	diesel
AT900	BLDG 900-Gen	RADCOMM	1100	1100	1.00	diesel
AT931	BLDG 900 Gen	SEWERLIFT	150	150	1.00	diesel
AT1008	BLDG 1008-Gen	SFADMIN	300	300	1.00	diesel
AT1014	BLDG 1014-Gen	PWRSTABLDG	150	150	1.00	diesel
AT1100.1	BLDG 1100	VEHICLE	250	250	1.00	used mixed fuel
AT1100.2	BLDG 1100	VEHICLE	250	250	1.00	used oil
AT1100.3A	BLDG 1100	VEHICLE	2500	2500	1.00	prop glycol
AT1100.3B	BLDG 1100	VEHICLE	2500	2500	1.00	prop glycol
AT1100.4	BLDG 1100	VEHICLE	275	275	1.00	antifreeze
AT1100.5	BLDG 1100	VEHICLE	275	275	1.00	hydraulic oil
AT1100.6	BLDG 1100	VEHICLE	275	275	1.00	engine oil
AT1100.7	BLDG 1100	VEHICLE	275	275	1.00	engine oil
AT1100.8	BLDG 1100	VEHICLE	275	275	1.00	trans fluid
AT1100.9	BLDG 1100	VEHICLE	275	275	1.00	tractor hyd fluid
AT1125	BLDG 1125	ARSVEHMAIN	250	250	1.00	used oil
AT1224.1	BLDG 1224	MSPNEUD	250	250	1.00	used oil
AT1224.2	BLDG 1224	MSPNEUD	250	250	1.00	hydraulic oil
AT1225	BLDG 1225	ARMAMENT	250	250	1.00	used oil
AT1296.1	BLDG 1296	HAZWASTE	250	250	1.00	used oil
AT1296.3A	BLDG 1296	HAZWASTE	5000	5000	1.00	used oil
AT1296.3B	BLDG 1296	HAZWASTE	5000	5000	1.00	used oil
AT1296.4A	BLDG 1296	HAZWASTE	5000	5000	1.00	used oil
AT1296.4B	BLDG 1296	HAZWASTE	5000	5000	1.00	used JP-8
AT1296.5	BLDG 1296	CCF	85	85	1.00	used gas
AT1296.9*	BLDG 1296	HAZWASTE	250	0	0.00	used fuel
AT1296.11	BLDG 1296	HAZWASTE	250	250	1.00	used antifreeze
AT1298	BLDG 1298-Gen	SEWAGELIFT1	150	150	1.00	diesel
AT1302	BLDG 1302-Gen	PWRSTABLDG	300	300	1.00	diesel
AT1303.1	TANK 1303	POLSTOR	10,000	23,143	2.31	gasoline
AT1303.2	TANK 1303	POLSTOR	10,000	23,143	2.31	gasoline

Table E-1
SUMMARY OF ASTs FOR CY 2005

Emission Source ID	Location	Facility	Capacity (gal)	Throughput (gal)	Turnovers (per year)	Material Stored
AT1304.1	TANK 1304	POLSTOR	30,000	60,000	2.00	diesel
AT1304.2	TANK 1304	POLSTOR	30,000	10,000	0.33	JP-8
AT1306.1	TANK 1306	POLSTOR	20000	0	0.00	prop glycol
AT1306.2	TANK 1306	POLSTOR	20000	20,000	1.00	prop glycol
AT1308	TANK 1308	POLSTOR	250	250	1.00	waste fuel
AT1310.1	BLDG 1310	VEHFUELSTA	6,000	24,000	4.00	gasoline
AT1310.2	BLDG 1310	VEHFUELSTA	6,000	24,000	4.00	gasoline
AT1310.3	BLDG 1310	VEHFUELSTA	6,000	37,317	6.22	diesel
AT1314.1	TANK 1314.1	POLSTOR	1,500,000	7,191,506	4.79	JP-8
AT1314.2	TANK 1314.2	POLSTOR	1,500,000	7,191,506	4.79	JP-8
AT1314.3	TANK 1314.3	POLSTOR	1,500,000	7,191,506	4.79	JP-8
AT1317	BLDG 1317 - Gen	POLSTOR	500	500	1.00	diesel
AT1319	BLDG 1319-Gen	POLOFF	150	150	1.00	diesel
AT1321	BLDG 1321	POLSTOR	12,000	9889	0.82	JP-8
AT1328.1**	BLDG 1328	HEATPLANT	5,000	0	0.00	no. 1 fuel oil
AT1332.1	BLDG 1332	EMSPHASE	250	250	1.00	used oil
AT1339.1	BLDG 1339	ENGSHOP	250	250	1.00	used JP-8
AT1339.2	BLDG 1339	ENGSHOP	250	250	1.00	used oil
AT1344.1	BLDG 1344	HUSHSE1	2,500	115,313	46.13	JP-8
AT1344.2	BLDG 1344	HUSHSE1	250	250	1.00	1010 oil
AT1344.3	BLDG 1344	HUSHSE1	250	250	1.00	used JP-8
AT1344.4	BLDG 1344	HUSHSE1	250	250	1.00	used oil
AT1347.5	BLDG 1347-Gen	AFFF	150	150	1.00	diesel
AT1347.6	BLDG 1347	AFFF	300	300	1.00	diesel
AT1347.7	BLDG 1347	AFFF	300	300	1.00	diesel
AT1347.8	BLDG 1347	AFFF	300	300	1.00	diesel
AT1347.9	BLDG 1347	AFFF	300	300	1.00	diesel
AT1351.1	BLDG 1351-Gen	PWRPROD	150	150	1.00	diesel
AT1351.2	BLDG 1351	PWRPROD	275	275	1.00	15W40 oil
AT1351.3	BLDG 1351	PWRPROD	250	250	1.00	used oil
AT1353.1	BLDG 1353	VEHICLE SHP	250	250	1.00	used oil
AT1353.2**	BLDG 1353	VEHICLE SHP	250	0	0.00	used fuel
AT1354	BLDG 1354	EQUIPMENT	85	85	1.00	used oil
AT1355.3	BLDG 1355	EQUIPMENT	6000	6000	1.00	potas acetate
AT1355.4	BLDG 1355	EQUIPMENT	6000	6000	1.00	potas acetate
AT1355.5	BLDG 1354	HEAVYEQUIP	6000	0	0.00	potas acetate
AT1359.1	BLDG 1359	AGE	5,000	0	0.00	gasoline
AT1359.2	BLDG 1359	AGE	10,000	100,000	10.00	JP-8
AT1359.3	BLDG 1359	AGE	5,000	85,014	17.00	JP-8
AT1359.4	BLDG 1359	AGE	250	250	1.00	used JP-8
AT1359.6	BLDG 1359	AGE	250	250	1.00	used antifreeze
AT1359.7	BLDG 1359	AGE	300	300	1.00	used oil
AT1365.1	BLDG 1365	AIRCRAFTMA	250	250	1.00	used oil
AT1365.2	BLDG 1365	AIRCRAFTMA	250	250	1.00	used JP-8
AT1402	BLDG 1402-Gen	WTERPLANT	500	500	1.00	diesel
AT1403	BLDG 1403-Gen	WTRPUMPSTA	350	350	1.00	diesel
AT1413	BLDG 1413- Gen	SEWERLIFT 2	150	150	1.00	diesel
AT1501	BLDG 1501-Gen	COMMANDPS	300	300	1.00	diesel
AT1788.1	BLDG 1788	726ACS	250	250	1.00	used oil
AT1788.3*	BLDG 1788	726ACS	500	0	0.00	EMPTY
AT1804.1	BLDG 1804	GOLFCOU	1200	1200	1.00	diesel
AT1804.2	BLDG 1804	GOLFCOU	500	500	1.00	diesel
AT1804.3	BLDG 1804	GOLFCOU	500	500	1.00	gasoline
AT1804.4	BLDG 1804	GOLFCOUR	85	85	1.00	used gas
AT1804.5	BLDG 1804	GOLFCOUR	85	85	1.00	used oil
AT1804.6	BLDG 1804	GOLFCOUR	250	250	1.00	used diesel

Table E-1
SUMMARY OF ASTs FOR CY 2005

Emission Source Id	Location	Facility	Capacity (gal)	Throughput (gal)	Turnovers (per year)	Material Stored
AT1806	BLDG 1806	STOR	1200	1,200	1.00	diesel
AT1807	BLDG 1807	HORSESTA	1200	1,200	1.00	diesel
AT1819	BLDG 1818 - Gen	SEWERLIFT 6	150	150	1.00	diesel
AT2103	BLDG 2103-Gen	WELL #2	350	350	1.00	diesel
AT2192	BLDG 2192-Gen	WELL #12	600	600	1.00	diesel
AT2209.1	BLDG 2209	AUTOSKILLS	250	250	1.00	used antifreeze
AT2209.2	BLDG 2209	AUTOSKILLS	1000	1,000	1.00	used oil
AT2316	BLDG 2316-Gen	DININGHALL	1000	1,000	1.00	diesel
AT2708	BLDG 2708-Gen	SEWERLIFSTA	150	150	1.00	diesel
AT3016**	BLDG 3016	MUNITIONS	1000	0	0.00	no. 1 heating oil
AT3018**	BLDG 3018	MUNITIONS	500	0	0.00	No. 1 fuel oil
AT3020.1**	BLDG 3020	MUNITIONS	500	0	0.00	No. 1 fuel oil
AT3020.2**	BLDG 3020	MUNITIONS	500	0	0.00	No. 1 fuel oil
AT3490.1	BLDG 3490	CONTRACTOR	350	350	1.00	gasoline
AT3490.2	BLDG 3490	CONTRACTOR	350	350	1.00	diesel
AT3495.1*	BLDG 3495	WWTPPLANT	800	0	0.00	diesel
AT3495.2	BLDG 3495	WWTPPLANT	8,500	8,500	1.00	diesel
AT3504	BLDG 3504-Gen	PWRSTABLDG	110	110	1.00	diesel
AT3509.1	BLDG 3509	COMMTRANS	300	300	1.00	diesel
AT3509.2	BLDG 3509	COMMTRANS	1200	1,200	1.00	diesel
AT3510	BLDG 3510-Gen	PWRSTABLDG	150	150	1.00	diesel
AT3522	BLDG 3522-Gen	COMMFACT	150	150	1.00	diesel
AT3525	BLDG 3525-Gen	PWRSTABLDG	110	110	1.00	diesel
AT3535	BLDG 3535-Gen	PWRSTABLDG	110	110	1.00	diesel
AT3539	BLDG 3539-Gen	PWRSTABLDG	110	110	1.00	diesel
AT3600	BLDG 3600-Gen	CONTROLTOWER	750	750	1.00	diesel
AT4109.1	BLDG 4109	CLUBHSE	500	2,484	4.97	gasoline
AT4798	BLDG 4798-Gen	WELL 6	350	350	1.00	diesel
AT4799	BLDG 4799-Gen	BOOSTERPU	300	300	1.00	diesel
AT4827	BLDG 4827-Gen	WELL 11	600	600	1.00	diesel
AT4990.1	BLDG 4990	LANDFILL	2,500	6,612	2.64	diesel
AT4990.2	BLDG 4990	LANDFILL	250	250	1.00	used oil
AT5250	BLDG 5250-Gen	BOOSTERPU	150	150	1.00	diesel
AT6000	BLDG 6000-Gen	Hospital	20,000	20,000	1.00	diesel
AT6200.1	BLDG 6200	AAFESGASSTA	10,000	1,571,499	157.15	gasoline
AT6200.2	BLDG 6200	AAFESGASSTA	10,000	192,018	19.20	gasoline
AT6200.3	BLDG 6200	AAFESGASSTA	10,000	130,422	13.04	gasoline
AT6200.4	BLDG 6200	AAFESGASSTA	480	480	1.00	used oil
AT6300	BLDG 6300-Gen	FIRE STA #2	250	250	1.00	diesel
ATTRACE	SHED	CONTRACTOR	300	300	1.00	gasoline
AT8077	BLDG 8077 - Gen	WELL #6	540	540	1.00	diesel

Notes:

* = not in use at present

** = not in use, needs to be removed

= needs to be drained as it is no longer used

Table E-2
HAP SPECIATION FROM ASTs

HAP	CAS No.	Liquid Phase Weight Percent ¹ (%)		
		JP-8	Mogas	Diesel
Ethylbenzene	100-41-4		1.4	0.013
M-Xylene	108-38-3	0.06		
Hexane	110-54-3		1	0.0001
Propylohexane	1678-92-8	0.14		
Benzene	71-43-2		1.8	0.0008
Naphthalene	91-20-3	1.1		
O-Xylenes	95-47-6	0.06		
Cumene	98-82-8		0.5	
Xylene (mixed)	1330-20-7		7	0.29
Toluene	108-88-3		7	0.032

Note:

1 Volatile Speciation for Mogas and Diesel based on Air Emissions Inventory Guidance Document for Stationary Sources at Air Force Installations (USAF Institute for Environment, Safety, and Occupational Risk Analysis, 1999).

Volatile Speciation for JP-8 based on Air Emissions Inventory Guidance Document for Stationary Sources at Air Force Installations (USAF Institute for Environment, Safety, and Occupational Risk Analysis, 2001).

Table E-3

2005 - ON-BASE ASTS

Year 2005

Appendix D.3
Underground Storage Tanks

Number of Underground
Tanks Identified: 5

Emission Source Type:
Stationary

Emission Source ID: UT

F.1 Background

F.1.1 General

USTs are defined as stationary vessels having a majority of their storage capacity underground. USTs are used to store JP-8. They were grouped together as follows:

- **USTs Associated with Refueling Operations.** There are three USTs associated with the refueling of aircraft. Fuel is transferred to these tanks by pipeline and distributed to the hydrants along the flightline. The filling type is submerged.
- **USTs Associated with Defueling Operations.** There are two USTs used as defueling tanks. One has a capacity of 50,000 gallons and the other has a capacity of 25,000 gallons. They are located on the flightline. The filling type is submerged.

A summary of USTs is presented in Table F-1.

F.2 Emission Calculation Method

VOC emissions were calculated using the APIMS Tank Program incorporated from the TANKS 4.03 program (EPA, 1999). HAP emissions were calculated based on emission factors obtained from the *Air Emissions Inventory Document for Stationary Sources at Air Force Installation* (USAF IERA, 1999 and 2001 amendment for JP-8 Vapor Phase Speciation), Table F-2.

F.3 Sample Calculations

An example shows the basic UST calculations:

- 25,000-gallon JP-8 UST (Defueling Operations, Emission Source ID UT10040).
- Throughput = 655,508 $\frac{\text{gals}}{\text{yr}}$
- Toluene weight percent = 1.65%.

F.3.1 VOC Calculations

VOC emissions were calculated using the APIMS Tanks Program and the input data for each tank.

$$\text{VOC} = 169.5 \text{ lbs/yr}$$

F.3.2 Toluene Calculations

Toluene emissions were derived from the weight percent of toluene in JP-8.

$$\text{Toluene} = (\text{Toluene vapor wt \%}) (\text{VOC emissions})$$

$$\text{Toluene} = \left(\frac{1.65}{100} \right) \left(169.5 \frac{\text{lbs}}{\text{yr}} \right) = 2.8 \frac{\text{lbs}}{\text{yr}}$$

F.4 Actual Emissions Summary

The APIMS Tank program estimated actual HAP and VOC emissions based on the number of turnovers from each UST summarized in Table F-3.

F.5 Potential Emissions Summary

Potential VOC and HAP emissions were assumed to equal actual emissions (based on number of conservative tank turnovers per year).

Table F-1
SUMMARY OF USTs FOR CY 2005

Emission Source ID	Tank Number	Facility ID	Capacity (gal.)	Material Stored	Throughput (gal/yr)	Turnovers(per yr)
UT0265.1	265.1	Hydrant Pumps	50,000	JP-8	816,395	16.3
UT0265.2	265.2	Hydrant Pumps	50,000	JP-8	816,395	16.3
UT0265.3	265.3	Hydrant Pumps	50,000	JP-8	816,394	16.3
UT10040	10040	DEFUEL	25,000	JP-8	655,508	26.2
UT10041	10041	DEFUEL	50,000	JP-8	655,508	13.1

Table F-2
HAP SPECIATION FROM USTs

HAP	CAS No.	Vapor Phase Weight Percent ¹ (%)		
		JP-8	Fuel Oil	Diesel
Ethylbenzene	100-41-4	0.86	0.7	0.7
P-Xylene	106-42-3	0.71	0	0
M-Xylene	108-38-3	2.42	0	0
Toluene	108-88-3	1.65	4.1	4.1
Hexane	110-54-3	0.84	0	0
2,2,4-Trimethylpentane	540-84-1	0.02	2.3	2.3
Benzene	71-43-2	0.2	7.2	7.2
Naphthalene	91-20-3	0.38	0	0
O-Xylenes	95-47-6	1.61	0	0
Cumene	98-82-8	0.29	0.4	0.4
Xylene (mixed)	1330-20-7	0	2.5	2.5

Note:

1 Volatile Speciation for Mogas and Diesel based on Air Emissions Inventory Guidance Document for Stationary Sources at Air Force Installations (USAF Institute for Environment, Safety, and Occupational Risk Analysis, 1999).

Volatile Speciation for JP-8 based on Air Emissions Inventory Guidance Document for Stationary Sources at Air Force Installations (USAF Institute for Environment, Safety, and Occupational Risk Analysis, 2001).

Table F-3

2005 - UNDERGROUND STORAGE TANKS

Year 2005

Appendix D.4
Aerospace Equipment

Number of AGE Sources Identified: 32

Emission Source Type: Stationary/Portable

Emission Source ID: AGE

G.1 Background

G.1.1 General

Aerospace ground equipment (AGE) includes generators, air carts, hydraulic test stands, compressors, air conditioners, light carts, heaters, bomblift trucks, and welders. AGE is used in direct support of aircraft operations. AGE can be grouped into two major source categories: internal combustion (reciprocating or piston) engines and turbines. Internal combustion engine units are considered by IDEQ mobile emission sources and are not covered in this report. Turbine units are currently considered stationary emission sources and are summarized in Table G-1. Run-time hours for each AGE equipment unit was derived from the database provided by AGE personnel. A summary of annual run-time hours and number of equipment units is presented in Appendix AAA-2.

G.2 Emission Calculation Method

The APIMS standard algorithm code AGE-50 was identified to calculate criteria emissions. Emission factors are summarized in Table G-2.

The 2005 annual operating hours for both the engine and turbine generators was estimated at 12,671 hours per year based on the run-time hours recorded for each unit. A conservative estimate was established to account for 90 percent of the fuel consumed from the turbine generators and 10 percent from the engine generators.

G.3 Sample Calculations

For equipment with EFs in units of lbs/1,000 gal of fuel, only the annual fuel use obtained from records on base and the EF are used to calculate emissions:

- Type of equipment: A/M32A-60A (36 units) generators.
- Type of fuel: JP-8.
- Annual operating hours (turbine generators): 12,671 hrs/yr
- CO emission factor: 0.160 lb/gal
- Power load: 75 kVa per unit
- Conversion: 1 kVa = 0.8 KW,
- Conversion: 1 KW = 3413 BTU/ hr
- Heating Value of JP-8: 135,000 BTU/gal

$$CO = \left(75 \text{ kVa} \right) \left(0.8 \frac{\text{kW}}{\text{kVa}} \right) \left(3,413 \frac{\text{BTU}}{\text{hr} \cdot \text{kW}} \right) \left(0.16 \frac{\text{lb}}{\text{gal}} \right)$$
$$\left(12,671 \frac{\text{hr}}{\text{yr}} \right) / \left(135,000 \frac{\text{BTU}}{\text{gal}} \right) = 3075.3 \text{ lb / yr}$$

G.4 Actual Emissions Summary

The APIMS Process ID and actual annual criteria pollutant and HAP emissions are presented in Tables G-3 and G-4, respectively.

G.5 Potential Emissions Summary

Potential usage of AGE equipment was based on the potential increase in aircraft operations ($K_{p/a} = 1.5$).

The APIMS Process ID and potential annual criteria pollutant and HAP emissions are presented in Tables G-5 and G-6, respectively.

Table G-1
CY 2005 INVENTORY AND ACTUAL USE OF AGE

Equipment	Type Engine	Number of Units	Unit Rated Power hp	RPM	Fuel Type	Annual Run Time Hours
Generators						
A/M32A-60A	Turbine	32	N/A	42,000	JP-8	12,671

Note: Generator Carts and Compressors that contain turbine AGE equipment were removed from service.

TABLE G-2
AGE EMISSION FACTORS

Emission Factors (lb/1,000 gal)	Generator A/M32A-60A
PM10	3
NOx	40
SOx	6.2*
CO	160
VOC	2
HAPS	
Acetaldehyde	2.09E-03
Acrolein	3.00E-04
Benzene	1.50E-02
Ethylbenzene	8.78E-04
Formaldehyde	2.03E-02
Toluene	4.36E-03
Xylenes	2.69E-03

Notes:

* SOx Emission factors were obtained from the Calculation Methods Inventories, for Criteria Air Pollutant Emission Armstrong Lab., 1994.

All other emissions were obtained from the Air Emission Inventory Guidance Document for Mobile Sources at Air Force Installation, IERA, 2002.

2005 Actual Emissions

Table G-3

Calculation Name:		TURBINE AGE									
Process ID	Process Name	Unique Process ID	CAS No.	Chem. Name		Emissions (LBS)	Emissions (Ton)				
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 6300080		CARBON MONOXIDE		3075,2799	1.53764				
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 NOX		OXIDES OF NITROGEN		768,82	0.38441				
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 PM10		PARTICULATE MATTER <10UM (PM10)		57,6615	0.028831				
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 SOX		OXIDES OF SULFUR		119,1671	0.059584				
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 VOC		VOLATILE ORGANIC COMPOUNDS (VOC)		38,441	0.01922				

2005 HAP Actual Emissions

Table G-4

Calculation Name: TURBINE AGE

Process ID	Process Name	Unique Process ID	CAS No.	Chem. Name	Emissions (LBS)	Emissions (Ton)
IFU1216780---60A	32A-60A: ALL AGE GENERATORS (TURBINE) USING JP-8	780 107028	ACROLEIN		0.0058	0.000003
IFU1216780---60A	32A-60A: ALL AGE GENERATORS (TURBINE) USING JP-8	780 108883	TOLUENE		0.0838	0.000042
IFU1216780---60A	32A-60A: ALL AGE GENERATORS (TURBINE) USING JP-8	780 75070	ACETALDEHYDE		0.0402	0.00002
IFU1216780---60A	32A-60A: ALL AGE GENERATORS (TURBINE) USING JP-8	780 50000	FORMALDEHYDE		0.3902	0.000195
IFU1216780---60A	32A-60A: ALL AGE GENERATORS (TURBINE) USING JP-8	780 1339207	XYLENE (MIXED)		0.0517	0.000026
IFU1216780---60A	32A-60A: ALL AGE GENERATORS (TURBINE) USING JP-8	780 00071-43-2	BENZENE		0.2883	0.000144
IFU1216780---60A	32A-60A: ALL AGE GENERATORS (TURBINE) USING JP-8	780 00100-41-4	ETHYLBENZENE		0.0169	0.000008

2005 Potential Emissions

Table G-5

Calculation Name: TURBINE AGE						
Process ID	Process Name	Unique Process ID	CAS No.	Chem. Name	Emissions (LBS)	Emissions (Ton)
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 630080		CARBON MONOXIDE	4612.92	2.306
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 NOX		OXIDES OF NITROGEN	1153.23	0.577
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 PM10		PARTICULATE MATTER <10UM (PM10)	86.49	0.043
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 SOX		OXIDES OF SULFUR	178.75	0.089
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 VOC		VOLATILE ORGANIC COMPOUNDS (VOC)	57.86	0.029

2005 HAP Potential Emissions

Table G-6

Process ID	Process Name	Unique Process ID	CAS No.	Chem. Name	Emissions (LBS)	Emissions (Ton)
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 107028		ACROLEIN	0.01	0.000006
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 108883		TOLUENE	0.13	0.00006
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 75070		ACETALDEHYDE	0.06	0.00003
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 50000		FORMALDEHYDE	0.59	0.00029
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 1330207		XYLENE (MIXED)	0.08	0.00004
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 00071-43-2		BENZENE	0.43	0.00022
IFU1216780---60A	32A-60A; ALL AGE GENERATORS (TURBINE) USING JP-8	780 00100-41-4		ETHYLBENZENE	0.03	0.00001